POLLUTION PREVENTION PROGRAM

POLLUTION PREVENTION REPORTER

Waste Minimization/Pollution Prevention (WMin/PP) Information Vol. II ▪ No. 2 ▪ June 1995

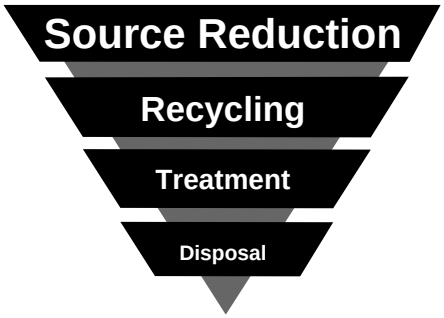
Waste-Management Costs (Why Should I Spend Money on Waste Minimization?)

By: Michelle Burns

A frequently asked question is "Why should I spend money to minimize the waste I generate if waste disposal does not cost me anything?" This problem is not unique to Los Alamos, where wastes generated by the Department of Energy (DOE) Defense Programs (DP), Energy Research (ER), and many other offices, are "handed off" to the Waste Management Program which is directly funded by DOE Environmental Management (EM). DOE recognizes that this current system insulates waste generators from the financial impact of waste-disposal costs and, as a result, removes the incentive to reduce waste generation.

Last year, the LANL Pollution Prevention Program Office (P^3O) participated in a DOE-wide effort to model "avoidable" waste-management costs. "Avoidable" costs are those which are volume-dependent or directly related to the generation of each new unit of waste. In other words, they are the costs which would not be incurred if the waste were not generated. The results of the study were published by the Idaho National Engineering Laboratory (INEL), "Avoidable Waste Management Costs" (INEL-94/0205).

The method used to identify these avoidable waste-management costs is called "activity-based costing." In brief, flow diagrams of the waste-management process, from the point at which the material is declared waste to the point of final disposition, were developed. Activity descriptions were then written



for each step in the flow diagram. Finally, interviews were conducted with the personnel that package, monitor, characterize, document, transport, receive, store, and dispose of wastes to determine how much time and what materials are used to perform each activity. This type of investigation was performed for nine waste types.

Because the study examined the "life cycle" of waste-management costs from

Case Example: LLW-CH LANL Chemical and Metallurgical Building

Activity description	Activity Cost ($/m^3)	Cost incurred for WM
Generator declares material waste	$ 0	
Waste packaging	$ 363	CMR
Waste profile processing	$ 10	40% WM & 60% Gen.
Radiological survey	$ 54	ESH1/Facility
Waste sampling/analysis	$ 1,571	R&D Group (Gen.)
Radioactive waste manifest processing	$ 41	WM & CMR
Radioactive material transport documentation	$ 56	W. Coordinator/WM & CMR
Arrange transport	$ 27	WM
Radiological survey	$ 52	ESH1/CMR
Transport to disposal	$ 29	Facility or R&D Group (Gen.)
Receive at disposal	$ 24	WM Ops.
Emplace waste	$ 512	WM Ops.
Waste burial	$ 398	WM Ops.
Data management	$ 29	WM Ops.
Total ($/m^3)	$3,166	
Total ($/ft^3)	$90	

Acronyms	
CH	contact handled
CMR	Chemistry and Metallurgy Research
ESH	Environment, safety, and health
LLW	low-level waste
R&D	Research and development
WM	Waste management

	Totals ($/m^3)	Totals ($/ft^3)	Percent
Facility	$539	$15	17%
R&D Group	$1,581	$45	50%
WM	1,046	$30	33%

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point of generation to point of disposal, instead of just looking at the costs incurred by the Waste Management Program, some very interesting facts were revealed. Apparently, waste generators at LANL are bearing about 67% of the cost of managing waste! This is illustrated in the table above which shows the separate activities, the cost of each activity, and the identity of the source of the funds supporting the activity. Clearly, waste generators' budgets are bearing a large "hidden" cost for each unit of waste which is generated and turned over to the LANL Waste Management Program.

Therein lies the answer to the original question. For each new waste item, your budget must pay the cost to package, characterize, survey, monitor, document, and (in many cases) transport the waste to the waste-management organization. The less waste generated, the less money will be spent from your operations budgets on such tasks, which means more money for real work. Thus, an investment in applying waste minimization to your process can have a real payback in dollars available to conduct research.

Pollution Prevention Opportunity Assessments

By: Paul Deininger

In FY95, process-waste assessments, now called pollution-prevention opportunity assessments (PPOAs), are being carried out through waste-minimization chargeback funding. The Pollution Prevention Program (P^3O) Chargeback system to fund implementation of pollution-prevention, waste-management activities began at the start of FY95. Efforts to improve the system and solve problems are still going on. The 39 mixed-waste-generating functions at Los Alamos National Laboratory (Los Alamos) have received primary attention as the major focus of this program. PPOA investigations of these 39 mixed-waste-generating areas have revealed that many of these mixed wastes are no longer being produced because of the shutdown of some processes and also because of the effects of the recent moratorium on mixed wastes. (Mixed waste has been reduced to less than 10% of 1989 production.) Work on the PPOA process for Los Alamos' 39 mixed-waste-generating processes is now complete with 23 PPOA completed reports being added to the database. Listed below are accomplishments to date:

- The Nuclear Materials Technology Division has been proactive in mixed-waste minimization and has greatly reduced its generation of low-level mixed wastes through material substitution. Although not as much progress has been made with transuranic (TRU) mixed-waste minimization, material substitution and treatment opportunities have been identified for each of the three major waste streams in this category.

- Some operations at the Chemistry and Metallurgy Research (CMR) Building have completely eliminated the generation of mixed waste through material substitution. For example, a rewritten PPOA on electroplating activities has detailed large waste-minimization accomplishments in this area.

- A facility-wide PPOA effort is also under way for all of the waste production at Sigma Facility. It will provide details of recent waste-minimization accomplishments in the metal-forming process.

- In addition, a site-specific plan (SSP) for one of the analytical areas in Chemical Science and Technology Division is in progress and will begin next month.

- In the area of nonmixed radioactive wastes, 12 PPOA investigations and reports are in various stages of completion. Waste-generating areas include the Los Alamos Meson Physics Facility, the Dynamic Experimentation Division Facilities, the environmental restoration (ER) sites, the CMR Facility, the TA-55 Facility, the TA-48 Facility, and the TA-50 Facility. SSPs and the various aspects of investigation and calculation they require are in various stages of completion for four of these areas. Three projects are currently being funded and implemented under Chargeback.

- Identification of the largest waste-generating functions has been carried out through the Los Alamos Waste Management databases to find out which wastes are being disposed of at the TA-50 and TA-54 facilities in the largest volume.

Los Alamos has provided (to the Department of Energy) written notification on all waste-minimization successes identified by this work. This notification acknowledges the groups and facilities which have made significant efforts and achieved major successes in waste minimization.

SSP work will continue in those areas where waste minimization is anticipated. The majority of waste-minimization chargeback efforts for the remainder of FY95 will focus on radioactive wastes produced at Los Alamos.

Pollution Prevention by Design

By: Mike Kennicot

Los Alamos National Laboratory (LANL) employees attended the training course "Orientation to Pollution Prevention for Facility Design" on June 6. The course included a variety of instructional materials and actual tools that students can use on their own design projects. The course was presented by members of the Westinghouse Hanford Pollution Prevention Program, sponsored by the LANL Pollution Prevention Program Office (P^30). P^30 is a participating pilot test site for software developed at Hanford. The software program "Electronic Design Guideline (EDG) for Pollution Prevention" includes a database for pollution prevention during design as well as hypertext support in the form of examples, pictures, and references. The software program also includes information for each pollution-prevention opportunity, such as relative cost and savings, the design phase in which the opportunity needs to be considered, and when, during the life cycle of the facility (design, construction, operation, or decommissioning), pollution prevention will be realized. The software, and accompanying tools, are being tested at LANL on the Conceptual Design of the replacement Radioac-

tive Liquid Waste Treatment Facility. If these tools prove effective, they will be shared Lab-wide with anyone having an interest in design review. It is anticipated that upon completion of the pilot project, the pollution-prevention concepts learned can be applied to other design projects. Potential benefits of applying the tools to all design projects include:

• A head start in meeting the requirements of anticipated changes to DOE Orders 5400. 1, 4700, and 6430, currently being revised to require consideration of pollution prevention during design.

• Direction in designing a project to minimize or avoid wastes generated during construction, operations, and decommissioning. (Seventy percent of a product's life-cycle cost is fixed by design, and it is estimated that the amount of waste generated during construction of a facility is nearly the same as the amount generated during the first decade of operation.)

• Reduction in costs associated with waste management for a project. Ability to compute waste avoidance and cost-savings data will be used in defense of pollution-prevention ideas that may meet with resistance during design because of schedule and budget constraints.

The Pollution Prevention by Design Training was the first in a series of training courses being offered by the P^3O. More information will be published in the near future. Any suggestions for candidate classes should be directed to Mike Kennicott at 5-6730.

Pollution Prevention on the WWW—Environmental Awareness Hits the Internet!

By: Julius Din

In the past few years, Los Alamos National Laboratory (Los Alamos) has been making a proactive effort to make access to the Internet available to all offices. Electronic mail (E-mail) is now widely in use at Los Alamos, and Los Alamos-wide information services, such as the Los Alamos phone book, and the Los Alamos Newsbulletin, can be accessed through the World Wide Web (WWW).

If you use an E-mail package, such as EUDORA, CC:Mail, or GroupWise from your desktop, the chances are very likely that you already have a connection to the Internet. If you are using a "web" browser package, such as Mosaic, Netscape, or Chameleon to access Los Alamos information, then you definitely have direct access to the WWW. Ask your local Los Alamos systems administrator/management information system guru, or call the 7-HELP (7-4357) for more details on how to get "online."

Now, what does the WWW have to do with pollution prevention? The WWW is a medium through which millions of people can exchange their ideas and accomplishments. The WWW allows us to disseminate and exchange information quickly and efficiently, but doesn't require ink, paper, plastics, or other consumable products. The WWW has opened the door for Los Alamos' Waste Minimization and Pollution Prevention (WMin/PP) Program to reach out to the Los Alamos community.

However, access to the P^3O WWW server is selective. The requirements are an open mind and a willingness to learn. Once inside, you will find information about the programs sponsored by Los Alamos's Pollution Prevention Program. There is the Chemical Exchange Program, through which Los Alamos program employees can review a list of available surplus chemicals and order them online.

You can access information about the University of California (UC) Performance Measures, which tracks the progress of Los Alamos Divisions in reducing their waste streams. Information regarding the WMin/PP Chargeback Program is also available from the server.

If you are a UC employee and have an idea about how to reduce waste at your work site, why not enter your idea into the Pollution Prevention Awards Program? Even if you just want to make yourself known, you can send your messages, comments, or questions online through the P^3O's WWW server.

In the next few weeks, the P^3O WWW server will be adding a section on Materials Substitution, as well as a mechanism for Los Alamos's waste-management coordinators to apply online for Process IDs.

Los Alamos is far from being alone in providing pollution-prevention information on the WWW. P^3O has compiled a list of Waste Minimization, Pollution Prevention, Clean Manufacturing, and Environmentally related WWW servers around the world. Information on these other servers can be applied to activities at your job site, at home, and in your local community. You can access these servers, through "hot links" from this list. If there is a specific topic that you cannot find on this list, we have also compiled a "hot list" of WWW Search Engines available on the Web.

Pollution prevention is a combination of knowledge and common sense. The Los Alamos WMin/PP Program will provide you with the knowledge; it is everyone's personal responsibility to use common sense and implement it. Currently, the P^3O server is available from 8 A.M. to 6 P.M., Monday through Friday.

Some portions of the P^3O WWW are limited to Los Alamos computers, but there is information available for everyone. If you already have Mosaic, Netscape, Chameleon, or some other "web" browser, you can access the P^3O server directly, using the following uniform resource locator (URL) address: **http://perseus.lanl.gov/**

Announcing the Annual Pollution Prevention Awards Program

By: Jeoff Urioste

The call for Pollution Prevention Award submittals has been sent out to all group secretaries (look for a poster in your area which announces this program). The awards program is designed to provide recognition for 'good' pollution-prevention practices which are either ongoing, upcoming, or which could be incorporated into Laboratory practices in the future. Cash awards are distributed to University of California (UC) employees (individuals or groups of individuals) in each of three categories as follows:

1) Large Scale—more than $5000 to implement,
2) Small Scale—less than $5000 to implement, and
3) Administrative.

Three winners are possible in each category with a maximum award of $2000 for first place in each category. **Entries must be submitted by the end of August.**

A volunteer judging committee has been established from personnel located across the Laboratory and will utilize the following five criteria to evaluate proposals:

1) Originality,
2) Resource benefit,
3) Implementation cost,
4) Feasibility, and
5) Impact on pollution prevention.

Therefore, your application should include the following:

1) A detailed description,
2) An assessment of implementation feasibility,
3) Resource benefits (for example, cost savings and raw material gain),
4) A list of resources needed for implementation, and
5) Identification of all contributors to the entry.

The entry form can be reviewed and submitted through the LANL P^3O home page on the Internet at the following address:

http://perseus.lanl.gov/ (See *Enter the Los Alamos Pollution Prevention Awards Program*).

Entry forms can also be acquired from the Pollution Prevention Program Office (665-8293) or from **Jeoff Urioste (665-3735), E-MAIL jau@emp.lanl.gov**. Review of all criteria and guidelines are available in the Administrative Manual AM 619.40.

Entries must be submitted by the end of August.

Los Alamos National Laboratory Waste Minimization/Pollution Prevention Chargeback Program

By: Michelle Burns

Los Alamos National Laboratory (LANL) instituted a Waste Minimization/Pollution Prevention (WMin/PP) Chargeback Program at the beginning of FY95. Chargeback is the term applied to funds collected from waste organizations, based on the type and quality of waste generated, for the support of WMin/PP implementation. This paper presents: (1) the WMin/PP implementation issues which the Chargeback Program was designed to address, (2) the elements of the LANL Chargeback Program, (3) allocation of Chargeback funds to support WMin/PP implementation at LANL, and (4) future development plans for the LANL program

Reasons for a WMin/PP Chargeback

Federal and state laws, regulations, executive orders, and policies, all mandate or encourage waste minimization and pollution prevention. In addition to establishing waste-reduction goals for all Complex facilities, the Department of Energy (DOE) has mandated that waste-minimization implementation strategies be performed (reference DOE Orders 5400.1, S400.3, S820.2A and Executive Order 12856). LANL management, too, has established an aggressive waste-minimization goal of 95% reduction in waste generation by the year 2000. While LANL does receive DOE Environmental Management (EM) funding to support the conduct of a "base" WMin/PP program which includes policy setting and guidance, technical support, pollution-prevention awareness initiatives, and tracking and reporting, the LANL Pollution Prevention Program Office (P^3O) does not receive direct funding for waste-minimization implementation activities. This has been clearly identified as the responsibility of the waste generator; however, one of the most difficult barriers to overcome is the lack of funding available to implement WMin/PP opportunities and actually reduce or eliminate waste.

At LANL, as at many other multi-cognizant secretarial office (CSO) sites within the DOE Complex, waste management is provided as a service by EM-30 to waste-generating programs. As a result, generators are insulated from the financial impact of the waste they produce, and therefore, feel little incentive to minimize waste. At LANL, generators "hand off" the waste they have produced to a separate waste-management organization; clear accountibility for the waste and a motivation for minimizing its generation is difficult to achieve. Therefore, LANL waste generators do not bear the cost of waste disposal. Waste is handled by LANL's Waste Management Group as a service, costing the Laboratory almost $90 million last year, or approximately 10% of the entire LANL budget.

This apparent lack of ownership has long been seen by waste-minimization professionals as the most significant obstacle to successful waste-minimization implementation at the generator level. In order to address these issues, the LANL P^3O developed and instituted the WMin/PP Chargeback Program beginning in October 1994. The goal of the program is to provide financial incentive to LANL waste generators to reduce, eliminate, or minimize their waste generation and to provide funding for the implementation of WMin/PP activities aimed at the generator's processes.

Elements of the Chargeback Program

The LANL Chargeback Program is intended to treat all generators equally with the only discriminator being the type of waste generated, including the Environmental Restoration and Waste Management (WM) programs. The system currently applies to all solid-waste types generated (i.e., low-level, mixed, TRU, and nonradioactive chemical wastes) as a dependable source of data for such wastes as exist in the LANL WM program databases. Sanitary wastes are not currently subject to Chargeback because these wastes are handled by the LANL support contractor which provides janitorial service, instead of the LANL WM program, and accurate tracking of the originating program of sanitary wastes is not performed. Finally, the Chargeback also does not currently apply to air emissions or liquids sent to the radioactive liquid-waste treatment facility (although the solid-waste product from liquid-waste treatment is charged), because the specific program of origin of such emissions is frequently not reliably tracked. However, because LANL already has several organizations aggressively pursuing the identification and reduction of such emissions, it was determined that the Chargeback Program would best serve LANL by focusing on the reduction of solid waste.

The Chargeback rate structure for FY95 is shown below. The mixed-waste class includes both low-level and TRU mixed waste. The "Hazardous Chemical" class includes all nonradioactive waste types which are not considered Sanitary, such as the Resource, Conservation, and Recovery Act (RCRA), non-RCRA, state-regulated, and the Toxic Substances and Control Act (TSCA) waste. The FY95 rates were intentionally set quite low to prevent the Chargeback Program from "putting generators out of business" while the initial bugs were worked out of the system; nonetheless, the structure clearly gives high priority to mixed-waste types because of the current lack of treatment and disposal options, regulation by the Federal Facility Compliance Agreement (FFCA), and the relatively simple techniques which can be employed to prevent the generation of such wastes. These rates reflect approximately 0.5% to 1% of the total waste-management cost and are not intended as a cost-recovery mechanism.

Waste Class	
Transuranic (TRU)	$2.00/ft^3
Low-Level Radioactive (LLW)	$2.00/ft^3
Mixed Waste	$13.50/ft^3
Hazardous Chemical*	$1.00/kg

* The term hazardous chemical is used in the broadest sense to refer to all chemical wastes that do not go to the sanitary landfill, including infectious wastes, TSCA, and RCRA hazardous waste.

Radioactive waste types (including mixed waste) are charged by volume because a significant WM consideration related to such wastes is the cost of replacing storage or disposal space occupied by these waste types. The chemical-waste types are charged by weight because the off-site commercial operations that treat and dispose of these wastes charge LANL according to the weight of these wastes.

These rates are charged to individual waste-generating programs every month, depending on the amount of each waste type generated. Generators are required to provide the appropriate cost-accounting information for each item of waste turned over to the WM program, and this information becomes part of the records maintained in the WM databases. The funds are captured directly from the generator's operating budget, collected by an automated vouchering/collection system developed and administered by the P^{3}O, which interfaces with the WM database and produces the vouchering documentation required by the LANL financial management system. No funds are transferred to the Environmental Management organization. Instead, they accumulate in a "colorless" site pool to be allocated to implementation projects as described below.

The automated Chargeback system produces documentation distributed to the appropriate LANL division directors who are responsible for the programs affected by the Chargeback. A cover memorandum, which can be easily modified, accompanies a table which clearly itemizes for the line managers the types and quantities of wastes generated by their programs as well as the total Chargeback cost. While this type of notification is not required by the LANL Recharge Office which oversees all such recharge systems in operation at the Laboratory, such information is considered critical to raising pollution-prevention awareness and establishing an understanding of the impact of waste generation.

Allocation of Chargeback Funds

As previously stated, the funds collected through the WMin/PP Chargeback Program enter a colorless LANL "pool" which is administered by the P^{3}0. Expenditure of the funds is directed by the P^{3}0, based upon sitewide WMin/PP priorities established as a result of strategic planning and historic waste-generation analyses conducted by the P^{3}0. The Chargeback funds support the activities described here.

Administration

A small percentage of the funds collected (not to exceed 10% of the total) were to be expended in support of the program. This is necessary to make the funding mechanism self-sustaining and not reliant on other programs. The funds are used for database management, software development and maintenance, generation and distribution of financial vouchers, the documentation sent to line managers, and addressing waste-generator questions. So far in FY95, only 5% of the revenue collected has been expended to support these functions.

PPOAs

The priority use of funds collected by the Chargeback Program is to complete Pollution Prevention Opportunity Assessments (PPOAs) for all LANL waste-generating processes. The PPOA is a systematic, planned investigation and

information-gathering operation used to (1) evaluate input materials and parameters of a process, (2) identify pollution and waste exiting from a process, and (3) generate and evaluate options for pollution-prevention implementation. The LANL Process Engineering Group (ESA-9) is being funded from the Chargeback pool to perform the PPOAs. To comply with the mixed-waste FFCA, LANL agreed to complete PPOAs on all mixed-waste generators in FY95. This has been accomplished because of the establishment of the Chargeback Program.

The PPOA effort is now concentrating on the priority waste types and priority facilities established by P^3O strategic planning. The priority waste types at LANL are currently the LLW and TRU streams which represent the largest volume and highest cost to the WM program. The current priority LANL facilities are the TA-55 Plutonium Facility, the Chemistry and Metallurgy Research (CMR) building, the Sigma building (all DP-operated facilities), the TA-50 Radioactive Liquid Waste Treatment Plant (an environmental-management-operated facility), and the meson physics and neutron scattering (Los Alamos Meson Physics Facility and Los Alamos Neutron Science Center) operations at TA-53 (many of which are conducted by Energy Research). These facilities have been targeted by the LANL Pollution Prevention Action Plan as priority areas for PPOA completion. Implementation of WMin/PP opportunities at these facilities is key to meeting the 95% waste-reduction goal and to extending the life of the LANL LLW disposal site. The need to complete PPOAs on 80% of the major waste sources at the site has been noted as an important means of recognizing the biggest priority waste-minimization opportunities. The completion of these PPOAs during FY95 and FY96 will help develop sufficient information to request and justify waste-minimization implementation funds for FY97 and FY98.

Site-Specific Plans

As the PPOAs are completed, the information gained from them will be used to prepare site-specific plans (SSPs) for the processes in each generator facility. An SSP identifies means of implementing waste-minimization and pollution-prevention processes, procedures, possible improvements, opportunities, and strategies. It addresses opportunities identified during the PPOA and serves as an implementation plan. Implementation of the work identified in the SSP is key to the success of LANL WMin/PP efforts.

WMin/PP Opportunity Implementation

Until specific requests for WMin/PP implementation funding for opportunities identified by PPOAs can be incorporated into the operational budgets of waste-generating programs, funding for such implementation can be provided by the pool of Chargeback funds. The opportunities identified at LANL by ESA-9 personnel conducting PPOAs are given priorities based upon return on investment (ROI) potential. The P^3O selects opportunities to be implemented utilizing Chargeback funding and considers which successes will most benefit LANL as a whole, the potential ROI, and the anticipated Chargeback revenues. Even though the FY95 priority for Chargeback funding is the conduct of PPOAs to identify implementation opportunities, three implementation projects will be supported by Chargeback funds as well. These projects are (1) installation of analytical equipment which will eliminate the mixed waste produced by the largest remaining LANL mixed-waste generator, (2) engineering and demonstration of magnetic separation equipment to recover actinides from caustic radioactive wastewater, and (3) modification of commercially available waste-box assay equipment, demonstration of the design, and possible installation which, if successful, will allow segregation of clean material from the LLW stream and significantly reduce the quantity of waste managed as LLW or TRU.

Future Development

As the Chargeback system begins to mature, challenges for sustaining it and making it the most effective tool possible are beginning to emerge. One such challenge, which will become more important as PPOAs and SSPs are completed and implementation is begun, is that the current Chargeback collection mechanism does not capture funds that can be used for capital expenditures. As the "low-hanging fruit" continues to be plucked in our pursuit of pollution-prevention solutions, the more complex problems facing us will require more complex solutions. Unfortunately, these items often carry large price tags which fall within the arena of capital funding. Until Chargeback funds can be allocated to capital expenditures, this may be a serious impediment to future waste-minimization implementation. The DOE is currently working this funding issue to allow Chargeback revenues to be utilized for capital purchases.

During this initial year of operation, the LANL P^30 has identified changes which must be made to the current Chargeback rate structure. For instance, the current rates do not coincide well with a recently completed study of the volume-dependent, direct costs of managing various waste types. In FY96, the rate structure will be changed to bring the Chargeback rates into better alignment with the relative costs of managing the different waste types and to better reflect the WMin/PP priorities established by P^30 (i.e., TRU will be the most expensive, and LLW costs must also be increased). Additionally, the broad "hazardous chemical" category must be broken up and costs applied to the various waste types to better reflect the actual hazard and WM costs. The current Chargeback rate of $1.00/kg results in exorbitant charges to generators of very heavy waste (like asbestos-lined safes or PCB-contaminated machine tools) which far exceed the costs borne by generators of much more hazardous RCRA-regulated wastes.

Also of concern is providing credit to waste generators for implementing WMin/PP, perhaps by providing a reduction in their Chargeback rates, as a means of providing additional incentives for conducting WMin/PP activities. Incentives

should also be provided to promote recycling.

Another challenge for the Chargeback system is in deciding what direction it takes from here. Many in the waste-minimization/pollution-prevention field argue that the best way to fully establish generator ownership of the waste and make them fully accountable is to have full cost-recovery systems in place. This type of system goes far beyond simple surcharges and has the generator bearing the full burden of waste-management costs. While this method may be very effective in achieving the end results desired, the practical aspects of implementing such a program are formidable. LANL WM and $P^3$0 personnel are developing a proposal for a pilot study of such a full cost-recovery program to be initially conducted between the Environmental Restoration and WM programs.

Eventually, if all goes well, a "point of diminishing returns" is expected to be reached. This occurs when the waste-generation rate has shrunk to a point that the cost to implement further waste reductions exceeds the WM costs which can be saved by eliminating the wastes. Consideration must be given to the elimination of the WMin/PP Chargeback at that point. Presumably, WMin/PP actions will have become fully integrated into the normal conduct of operations and into the budget requests of the programs conducting business at LANL by the time this point is reached, allowing for the elimination of Chargeback without adverse impact on waste generation.

Summary

The purpose of the WMin/PP Chargeback Program at LANL is not to support the activities of the P^3O. Instead, these funds are being accumulated for the specific purpose of raising generator awareness and making resources available for waste-minimization implementations at the generator level with the overall goal of achieving maximum waste reduction. The program office directs the funds at specifically identified priority processes by helping identify those processes, making plans for dealing with them, and assisting in the implementation of solutions. Reducing waste generation will (1) reduce the impact of this Chargeback on operating budgets, (2) further reduce the impact on operating budgets represented by the level of effort required to send wastes to the WM program, (3) assist the Laboratory in meeting regulatory requirements and aggressive waste-reduction goals, (4) reduce the overall portion of the Laboratory budget spent on waste management, and (5) promote LANL as an environmentally friendly neighbor. Even though Chargeback funds collected represent only a small fraction of the total costs incurred in handling, treating, packaging, administering, storing, and disposing of waste, the Chargeback Program is an important first step in achieving maximum waste reductions.

Chemical Exchange Assistance Program and External Recycle (CHEAPER)

By: Jay Stimmel

Waste Minimization/Source Reduction Activities

The chemical exchange program is a formal program for the internal exchange and external recycling of chemicals at Los Alamos National Laboratory. Surplus chemicals are offered to Laboratory personnel at no cost instead of being sent offsite for recycling or disposal. All the arrangements and costs for the transfer of these chemicals are handled by the program in order to encourage exchanges. The external program is being expanded to include Department of Energy facilities and other government entities, such as State agencies and schools. A cooperative effort is also being implemented to integrate the programs at Los Alamos and Sandia National Laboratories.

Benefits

The chemical-exchange program has increased the recycling of chemicals internally and externally at Los Alamos. The volume of used chemicals that have required disposal because of the lack of recycling opportunities has decreased. The proactive marketing and networking practices of the program have increased the exchange of a multitude of chemicals in use at Los Alamos. The program also decreases the quantities of new chemicals ordered and reduces the environmental impact of the manufacture of these chemicals. The risk of exposure during hazardous operations, such as transportation of chemicals to and from the Laboratory, will also be reduced. The project is linked to the automated chemical inventory system (ACIS), and the list of surplus chemicals is automatically downloaded to the Internet. The Internet is also used to advertise the program, to maintain the list of chemicals available for exchange, and to send electronic mail to facilitate chemical exchanges. These activities minimize the amount of paperwork required for the recycling of chemicals.

Uniqueness

CHEAPER is a user-friendly recycling program, which requires little effort and involves no costs for internal users at the Laboratory. This program is unique because (1) of the awareness, educational, and marketing campaigns that are part of the project and (2) the integration with other programs at Los Alamos. "Wishlists" are maintained so that there is a ready market for chemicals as soon as they become available for exchange. Another novel element of the program is the use of the Internet for publicity, awareness, education, and marketing of the chemical-exchange program. This project is part of the pollution-prevention efforts at Los Alamos and involves other programs such as Purchasing, Industrial Hygiene, Transportation, Materials Substitution, and Waste Management. The existence of an integrated program has increased the efficiency and effectiveness of chemical recycling at the Laboratory.

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Materials Substitution Committee

By: Jay Stimmel

Waste-Minimization/Source-Reduction Activities

The Materials Substitution Committee (MSC) is a low-budget, grass-roots effort supported by the Pollution Prevention Office to find nonhazardous substitutes for hazardous and toxic materials. The committee also investigates the use of alternative processes and procedures to reduce the amount of waste generated and serves as a clearinghouse for materials-substitution information and technologies. It provides technical assistance for interested organizations and coordinates substitution efforts at Los Alamos to minimize duplication of efforts and to maximize resources. The Waste Minimization/Materials Substitution Resources Database has been created to identify available information and resources. This is a multimedia bibliography of available waste-minimization and materials-substitution information.

In this capacity, the MSC has served as a resource to Los Alamos National Laboratory, Department of Energy facilities, other government agencies, academia, and private industry. There is a two-way flow of information into and out of the Lab with the committee serving as a single point of contact for outside organizations. The use of alternative materials, processes, and procedures minimizes or eliminates the amount of waste generated by operations. A central information clearinghouse reduces wasted individual efforts.

The MSC advocates the use of available technologies, process optimization and integration, and the entire life cycle of the material or process. To accomplish these goals, the committee interacts with other programs, such as Purchasing, Industrial Hygiene, Recycling, Environmental Compliance, and Waste Management. In addition to recommending alternatives, the committee supplies small samples to Los Alamos personnel at no cost to encourage substitution. This prevents the purchasing of unacceptable or unsuccessful substitutes in large quantities that would result in waste generation. The committee also advocates "connecting." This involves networking individuals with similar interests and needs inside and outside of the Lab.

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